

FOUR NEW LAMPYRID FIREFLIES

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Phaenolis mexicana n. sp.

Among the lampyrids in the collection of Cornell University is a specimen of an apparently undescribed species of *Phaenolis* from Mexico, collected by Dr. H. E. Evans. The general outline of the insect and some features of the elytral structure do not quite agree with Gorham's generic description, somewhat approaching *Lamprocera*, but the peculiar bilobed apical abdominal segment requires placing it in *Phaenolis*. Gorham described several species of *Phaenolis* from Mexico and Central America, all distinctly different from the present one, as is also Pic's *P. atripes*. No species of *Lamprocera* appears to have been reported from Mexico. The terminal abdominal segment and the aedeagus as far as visible, resemble those of other species of *Phaenolis*. *Polyclasis* (*Calypsocephalus*) is ruled out by the antennal structure and that of the last ventral segment, and by the shape of the pronotum.

A description of the new species is given below, and the type specimen is being deposited in the collection of Cornell University. I thank Dr. H. E. Evans and Dr. Henry Dietrich for the privilege of examining and describing this species. Sr. Federico Islas S., of the Instituto de Biología, Mexico City, kindly checked their collection for similar specimens, and for their cooperation I also thank Dr. J. C. Pallister, American Museum of Natural History, Dr. P. J. Darlington, Jr., Museum of Comparative Zoology, Dr. T. J. Spilman, U. S. National Museum, and Dr. C. M. F. von Hayek, British Museum (Natural History).

Holotype.—Male; Cornell University Type No. 3199.

Type locality "Gilberto Comancho", east of Huauchinango, Puebla, Mexico. Collected by Dr. H. E. Evans, June 18, 1951.

DESCRIPTION OF THE SPECIES.—Dimensions, 12.6 mm. long by 4.75 mm. broad.

Pronotum 2.6 mm. long by 4.15 mm. broad; very short, and widest at basal fifth, just forward of the 90° posterior angles; median brown and yellow rectangular area 2.0 x 1.9 mm. in basal three-fourths, with median longitudinal narrow channel; double row of large punctures at basal margin; apical edge reflexed; laterally broadly expanded and baso-laterally concave; yellow; entire surface densely punctate.

Scutellum and mesonotal plates brown.

Elytra 10.0 mm. long by 2.4 mm. broad; parallel for basal two-thirds, narrowing in lateral margins in apical third; explanate margins beginning at bases and becoming evanescent at about apical two-fifths, about ¼ elytral width at widest point, about basal fourth; coarsely and densely tuberculate or rugose; black (brown by

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transmitted light); 3 very indistinct costae; vestiture dense, short, dark brown. Wings appear black, but are translucent, have a very fine network structure, and a very short, black villosity.

Head small; frons black, 1.4 mm. across eyes, *ca.* 0.5 mm. between eyes; eyes not approximate ventrally; epistome projects downward between the antennal sockets, widening distally and exposing pale labrum below the emarginate apex; at the lower end of this triangular portion are the maxillary and labial palpi, both small and brown; terminal article of the maxillary palpus conoidal; mandibles—or at least what appear to be the mandibles in the absence of any other equivalent structure—project obliquely forward and downward, only very slightly curved, meeting at tips.

Antennae black, short, hardly longer than pronotum; articles 1 and 2 somewhat glistening, 2 very short, transverse; 3 to 10 biramous, each with two nearly equal, long, flat, narrowly elliptical rami; 11 longer than rami, remiform; sockets large and very close together—frons only 0.1 mm. wide between the edges; black vestiture, particularly on the edges of the rami and the 11th article.

Thorax ventrally dark brown; thoracic spiracles on short oblique tubes just posterior to the forecoxae.

Tergites to 6th dark brown; 7 laterally and 8 almost entirely yellow; latter sinuately trilobed and translucent; at least 3 to 7 have pronounced pointed lateral lobes.

Ventral segments 2 to 6 dark brown; 7 very short, broadly emarginate, medially yellow (luminous?); 8 pale yellow with a long subrectangular convex portion from the base, apically bilobed, covering the partly extruded genitalia. Abdominal spiracles are on the ventral surface near the antero-lateral corners of the segments.

Legs dark brown; claws simple; tibial spurs not distinguishable.

Aedeagus; the visible portion is a narrow, fusiform structure 1.4 mm. long by 0.28 mm. wide at middle, hollow, with a long opening apparently on the dorsal side; adjacent to this is a narrow tube bearing a hemispherical white tip.

Female unknown.

Paratype; in the collection of the U. S. National Museum there is a specimen of this species collected in Estado de Veracruz, Mexico, by R. Hanovic, June 26, 1897; this specimen was sent to E. Olivier in 1911 and returned without identification.

No key has been published for the 21 described species of *Phaenolis*; the following tentative key is arbitrary, being based mainly on coloration as given in the original descriptions.

A key to the species of *Phaenolis*.

Elytra unicolorous or nearly so:

1. Elytra black:

a. Pronotum orange:

i. Pronotum short, semilunate, apically rounded; 11.0 mm. (Brazil)

riparia E. Oliv.

ii. Pronotum short, angles right; elytra with small orange humeral spots; 7.0 mm. (Brazil)

scapulata E. Oliv.

b. Pronotum yellow:

i. Pronotum short and broad, not angulate apically; yellow with brown and yellow rectangular basal spot; 12.6 x 4.75 mm. (Mexico)

mexicana n. sp.

ii. Pronotum short, apically angulate; with rose discal spot; 9.5 x 3.5 mm. (Brazil)

sternalis

- c. Pronotum testaceous:
 i. Pronotal margin and discal vitta piceous; 10.0 mm. (Brazil) **atripennis** Pic
2. Elytra mainly brown, fuscous, or testaceous:
 a. Elytra brown:
 i. Pronotum apically angulate, pale yellow with narrow brown margin and large quadrate black spot reaching base; elytra with pale margins in basal half; 10.0 mm. (Peru) **infausta** E. Oliv.
 b. Elytra fuscous:
 i. Pronotum apically sinuate; orange with apical rectangular black spot; 14.0 mm. (Ecuador) **defecta** E. Oliv.
 c. Elytra testaceous:
 i. Pronotum apically angulate, testaceous, disk black; elytra parallel; 11.0 mm. (Ecuador) **abdita** E. Oliv.
3. Elytra yellow or orange:
 a. Elytra ochraceous yellow:
 i. Pronotum acuminate apically, ochraceous yellow; 12.7 mm. (Guatemala) **ochracea** Gorh.
 b. Elytra orange:
 i. Pronotum apically attenuate, orange with median black vitta; elytra with small apical black spots; 10.0 mm. (Brazil) **vittaticollis** Pic
- Elytra markedly bicolored:
 1. Elytra basally black:
 a. i. Apical half of elytra and last antennal articles reddish; pronotum black; 11.0 mm. (Ecuador) **apicipennis** E. Oliv.
2. Elytra apically black:
 a. Elytra basally orange:
 i. Elytra dilated at humeri and apically narrowed; pronotum orange; legs black; 15.0 mm. (Mexico) **atripes** Pic
 ii. Pronotum and bases of femora orange; 16.0 mm. (Colombia) **bicoloripes** Pic
 b. Elytra basally ochraceous:
 i. Apical third of elytra smokey black; pronotum dull ochraceous; 12.5-15.0 mm. (Central America) **laciniata** Gorh.
 ii. Basal third of elytra ochraceous; pronotum orange-yellow, disk red; 10.5-12.7 mm. (Mexico and Central America) **ustulata** Gorh.
 c. Elytra basally testaceous:
 i. Basal half of elytra pale testaceous; pronotum black, transverse, basally constricted; 15.0 mm. (Mexico) **nigricollis** Gorh.
 ii. Basal half of elytra pale testaceous, darker near scutellum; pronotum margined testaceous; 9.5 mm. (Brazil) **stipulicornis** Mots.
3. Elytra with black spots:
 a. Elytra mainly reddish or rufous:
 i. Elytra rufous, apices largely black; form narrow; 9.0 mm. (Peru) **olivieri** Pic
 ii. Elytra reddish with large black apical spots; pronotum transverse, disk red; 12.5 mm. (Brazil) **gorhami** E. Oliv.
 b. Elytra mainly reddish-yellow or testaceous:
 i. Elytra reddish-yellow with prolonged triangular apical black spot; 8.0 x 4.0 mm. (Brazil) **mimica** E. Oliv.
 ii. Elytra testaceous, with short black mark at bases, broadly black apically; pronotum testaceous, medially and laterally piceous; 10.0 mm. (Brazil) **basalis** Pic

***Photinus sanctae-luciae* n. sp.**

It is rather odd that no species of *Photinus* has been described from the island of St. Lucia, although species are reported from the nearby islands of Martinique and St. Vincent. As usual, the island conditions in the Lesser Antilles have resulted in local speciation, with the restriction of a species to a single island in the chain, or to two or three

adjacent islands. *Aspisoma insperata* E. Oliv. has been reported from St. Vincent, Grenada, Grenadines, and St. Lucia, and seems to be the only lampyrid so far reported from the latter island.

In the lampyrid collection of Cornell University there are three male specimens of a rather distinctive *Photinus*, which is described below as *Photinus sanctae-luciae*. The somewhat striking feature of this species to the unaided eye is the pair of white spots on the pronotum, which I have not noted in any other species of *Photinus*. The type and two paratypes are being deposited in the collection of Cornell University.

Holotype.—Male; Cornell University Type No. 3318.

Type locality Castries, Island of St. Lucia, Lesser Antilles. Collected by Dr. J. C. Bradley, September 10-22, 1919.

DESCRIPTION OF THE SPECIES.—Dimensions, 12.7 mm. long by 4.1 mm. broad.

Pronotum 2.68 mm. long by 3.7 mm. broad; almost semicircular in anterior $\frac{3}{4}$, slightly prolonged at apex, and widest at basal 4th, narrowing somewhat to the slightly obtuse posterior angles; base very slightly sinuate, raised in median half; apical 3d densely and coarsely punctate, flat lateral borders rather less so, disk obscurely punctulate, but smooth except for longitudinal depression or wide sulcus in basal half; single row of large punctures at margin. Extreme lateral and apical margins narrowly translucent yellow. Subrectangular brown spot, narrowed basally, in basal $\frac{2}{3}$, the brown pigmentation extending irregularly along base to the flat borders, and slightly so forward of the white spots; thence, much diluted, to apex. On each side of the brown area is an opaque ivory-white spot, the lateral edges of each being prolonged narrowly posteriorly across the ends of the basal extension of the brown area. Flat lateral areas translucent dark yellow. Short, fine, pale, appressed pubescence.

Scutellum yellow, apex rounded. Mesonotal plates dull brown.

Elytra 10.0 mm. long by 2.05 mm. broad; parallel in basal $\frac{2}{3}$, then tapering mainly in the lateral margins; apices separately rounded. Very narrow explanate margins, becoming evanescent at apical 3d. Scattered large punctures interspersed with a denser very fine punctulation, best seen at bases. Color light yellowish brown, darkened basally, and in two specimens indefinitely so in apical 4th. Short, dense, pale pubescence. No distinct borders, sutural or lateral, but margins may be paler.

Head; Frons angularly depressed between eyes; brown with yellow margins at eyes; interocular margins very slightly divergent upwards. Width across eyes 2.1 mm.; between eyes 0.76 mm. Eyes rather large. Clypeus short, dark yellow; labrum semicircular, dark yellow. Mandibles rather stout, evenly tapered, brown; *ca.* 0.6 mm. across in closed position. Maxillary palpi dark brown to black; terminal article of the usual conoidal outline. Labial palpi very small, terminal article asymmetrically crescentic.

Antennae brown, hairy, somewhat compressed, 6.25 mm. long.

Venter mostly yellow and brownish yellow; apical edges of abdominal segments darker, and much of the surface of 2nd to 5th ventral segments cream-colored. Segments 6 and 7 luminous, 2.0 and 1.5 times as long as 5th, respectively; 8th very small and short, mostly transparent; 6, 7, and 8 medially emarginate; 9 ogival, yellow. Tergites all yellow except pygidium, which is transparent, semicircular,

nicked at apex.

Legs dark yellow, tending to darken distally; very small spurs on meso- and post-tibiae; claws simple, bases broadened.

Female unknown.

The holotype and two paratypes are very similar, ranging in length from 11.75 to 12.9 mm., and in breadth from 4.1 to 4.35 mm.; the pronota are 1.2 to 1.5 times as broad as long, and the antennae about one-half the dorsal length.

In Leng and Mutchler's key to the Antillean species of *Photinus*, this species would apparently be placed in their *xanthophotis* group, but as so many of the species called *Photinus* in this key are *Diphotus*, a more definite location cannot be assigned.

***Photinus bidenticauda* n. sp.**

The specimen to which the above designation is applied was collected at Veracruz, Mexico, in September, 1955, by Dr. N. L. H. Krauss, of Honolulu, who kindly sent me an interesting collection of Mexican lampyrids. The remarkable feature of this insect, which otherwise appears as a small, rather pale *Photinus* resembling many other species of that genus, is the structure of the pygidium, which bears two dark brown triangular projections, apices ventrad, which nearly rest against the apical margin of the 8th ventral segment. The only clue to a previous description was given to me by Sr. Federico Islas S., of the Instituto de Biología, Mexico City, who kindly compared the description of this specimen with those in their collection and found a similar one labeled *Photinus phosphoreus* Deyrolle. No corresponding description by Deyrolle has so far been found, nor any description of a species with this structure. It seems unlikely that a describer would overlook such a pronounced peculiarity. Deyrolle's name would be preoccupied by *P. phosphoreus* Linné, 1767, a Brazilian species apparently considerably larger than this specimen. A detailed description of the specimen is given below; it is being deposited in the collection of Cornell University. No additional specimens are known.

Holotype.—Male; Type No. 3317, Cornell University.

Type locality, Veracruz, Mexico. Collected by Dr. N. L. H. Krauss in September, 1955.

DESCRIPTION OF THE SPECIES.—Dimensions, 6.0 mm. long by 1.9 mm. broad.

Pronotum 1.27 mm. long by 1.7 mm. broad; semi-elliptical from apex to basal 5th, then slightly constricted; basal edge a smooth curve; posterior angles fairly acute but not produced or salient; disk rose red with a narrow longitudinal median black vitta which expands to a brown area over the eyes. Remainder of surface pale yellow, densely punctulate, and somewhat translucent in front.

Scutellum basally yellow, apical half brown. Mesonotal plates pinkish.

Elytra 4.7 mm. long by 0.95 mm. wide; parallel; narrow explanate margins becoming evanescent at apical 5th. Ground color light brown, translucent, but appear-

ing dark brown over wings. Relatively wide lateral and narrower sutural borders yellow, occupying *ca.* $\frac{1}{3}$ of width. One somewhat oblique costa on each, not attaining either base or apex.

Head; Frons dark brown, very concave; width across eyes 1.3 mm.; between eyes 0.5 mm. Eyes relatively large; intraocular margins practically parallel. Mandibles very small, 0.28 mm. across in closed position. Maxillary palpi dark brown; terminal article of the usual conoidal outline. Labial palpi light brown, terminal securiform.

Antennae brown, somewhat compressed, hairy; 3.0 mm. long.

Prosternum pink; meso- and metasterna brown.

Tergites to 7th dark brown, not lobed; pygidium hexagonal as seen from above, semi-translucent. Two nearly black triangular projections extend downward from the ventral surface of the pygidium, sloping somewhat forward against the apical edge of sternite 8, and apex of pygidium is slightly deflexed against the apex of the 9th abdominal segment.

Abdominal segments 2 to 5 brown, the latter medially pale; 6 and 7 luminous, about twice as long as 5th; 8 mostly brownish yellow, basally paler, and as wide across the apical edge as the base of the 7th, narrowing to base, apical margin deeply emarginate, thickened along edges, and medially channeled; apparently luminous inside of the thickened margins. 9th segment dark yellow, sides nearly parallel to rounded apex.

Legs light yellowish brown; coxae of posterior pair project rather further than usual, largely hiding segment 2; tibial spurs, if present, indistinguishable; pads on 4th tarsal article very small; claws simple.

Female unknown.

The aedeagus was not extracted because of the danger of destroying the peculiar structure of the abdominal apex. No key covering the neotropical continental species of *Photinus* is available.

***Lucidota bicellonycha* n. sp.**

There are many instances among the Lampyridae in which two species belonging in quite different genera so closely resemble each other in color and form as to require minute examination to separate them. This has been remarked by LeConte, Gorham, and E. Olivier, and extends even to resemblances between lampyrids and lycids. A remarkable case of this kind has recently come to my attention while studying the lampyrids in the collection of Cornell University. Three specimens were set aside as being *Bicellonycha* (*Photuris*) *mexicana* Gorham. One of these was only about $\frac{2}{3}$ the length of the others, but superficially very similar. It had the same distribution of color, the same relatively long, nearly cylindrical antennae, the bifid claws, and the long median point on the 8th ventral segment, as *B. mexicana*. But the abdomen had only traces of a pair of rudimentary luminous organs on the 8th segment, the entire abdominal appearance being that usually associated with *Lucidota* s. l. Unlike *B. mexicana* the elytra were broadly but shortly explanate in the basal third; the frons was white, and the

mouth parts very prognathous, with large, stout mandibles. The aedeagus was quite unlike that of *Photuris*, showing some resemblance to that of *Lucidota atra*.

No description of such a species has been found, and it is therefore being described below as *Lucidota bicellonycha* n. sp. The genus *Lucidota* is undoubtedly composit and should be broken up into consistent genera, and until this is done the proper allocation of this species cannot be determined.

Holotype.—Type No. 3301, Cornell University. Male.

Type locality Oaxaca, Mexico. Collected by G. Lassmann, July 13, 1928.

DESCRIPTION OF THE SPECIES.—Dimensions, 8.9 mm. long by 4.0 mm. broad.

Pronotum 2.2 mm. long by 3.3 mm. broad; parabolic outline; posterior angles project back of the middle of the base, hence basal margin is sinuate; median longitudinal black vitta 0.9 mm. wide in basal two thirds, with well-defined straight sides, and extended along base nearly to humeri. (This vitta is usually triangular in *B. mexicana*.) Subtriangular pink area on each side of the black vitta. Remainder of surface transparent, rather coarsely but not densely punctate, even on black vitta. Scant yellow vestiture. Deep narrow pits adjacent to base at ends of basal extension of black vitta and nearly reaching bases of angles.

Scutellum rather narrow, black. Mesonotal plates black.

Elytra 6.75 mm. long by 2.0 mm. broad; black by reflected light, brown by transmitted light. (Elytra opaque in *B. mexicana*.) Distinctly elliptical outline, widest at about midlength. Explanate margins fairly wide at base, tapering rapidly and becoming evanescent at apical third. Densely tuberculo-rugose. Short brown vestiture. One costa visible, but indistinct. Apices taper laterally and suturally. No pale borders or vittae.

Head; Frons ivory-white, occiput brown, slightly depressed; width across eyes 1.6 mm.; between eyes just above antennal sockets, 0.66 mm. Eyes rather small and do not project beyond pronotum. Mouth parts decidedly prognathous; mandibles thick, sickle-shaped, 0.58 mm. across in close position. Maxillary palpi brown, terminal article conoidal, flattened on upper side, and with a sharp, flat, apical projection. Labial palpi brown, asymmetrically securiform. Clypeus apparently connate; apical edge nearly straight, with minute median denticle. Scattered reddish-brown hairs, some long, on mouth parts.

Antennae brown on upper surface, lighter below; slightly compressed, not dentate or serrate; 2nd article *ca.* $\frac{2}{3}$ as long as 3d; 3 to 8 subconical, bases inserted somewhat eccentrically in apex of preceding article. 4.1 mm. long, nearly $\frac{1}{2}$ body length.

Sides of prothorax pink; meso- and meta-segments dark brown.

Ventral abdominal segments 2 to 7 reddish brown; 8 narrower than 7, with narrow, hairy, median triangular projection *ca.* 0.6 mm. long, and indefinite pink areas laterally and medially. No distinct evidence of luminous organs. 9th, genital, segment, small, brown, ogival, convex, covering aedeagus. Dorsal segments not lobed, but 6th has small postero-lateral points. Abdominal spiracles not visible on venter.

Legs rather long, reddish to dark brown; profemora compressed, others not so; 2 strong tibial spurs on middle and posterior legs. Claws fairly large; all bifid.

Aedeagus; This organ broke up on attempt to extract it, but the main portions

were recovered. The median lobe, 1.65 mm. long, is flattened, tapering, and somewhat curved upwardly, apparently tubular with a narrow elliptical opening at the apex; attached to the base and reaching about to midlength is a strap-like projection. The median lobe is surrounded by a thin hyaline membrane not reaching the apex. The lateral lobes, 1.8 mm. long, are subrectangular in general outline, but have a short projection near the base on the dorsal edge, and are prolonged forward in a narrow point, curved inward and upward.

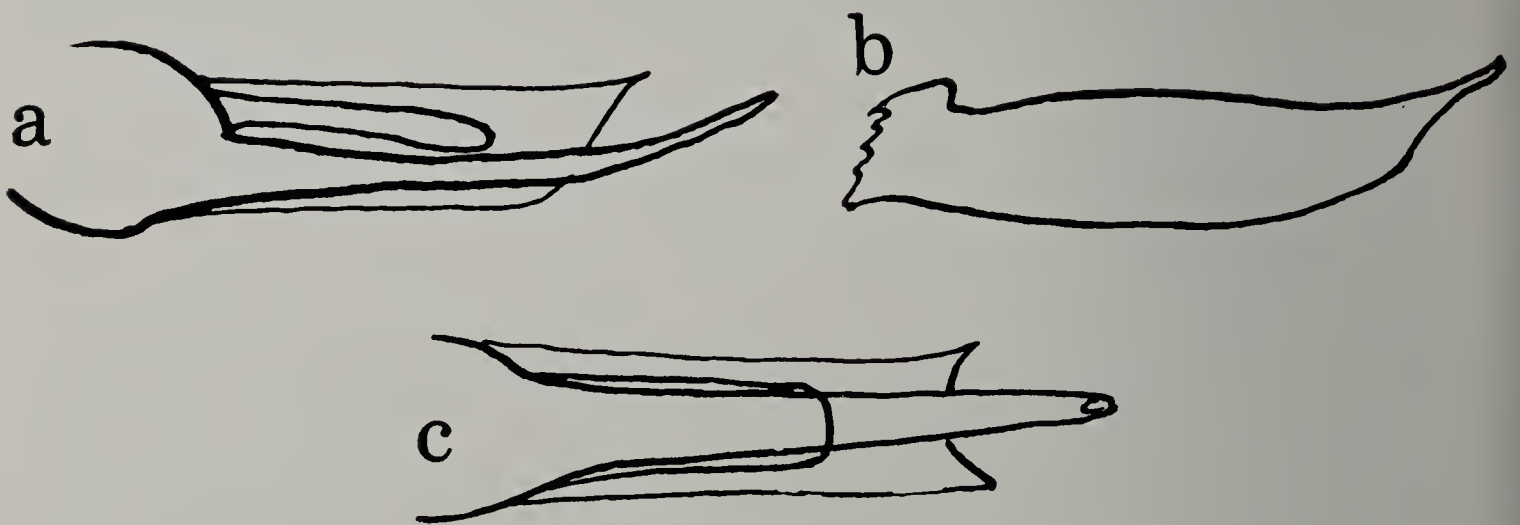


FIGURE 1. Relative size and arrangement of the aedeagus of *Lucidota bicellonycha*. Actual total length about 2.0 mm. A. Lateral view with lateral lobes removed. B. A lateral lobe. C. Dorsal view.

One male paratype in the collection of the Rockefeller Foundation, Mexico, D. F., collected by Wm. W. Gibson, 3 km. north of Tamazulysan, Oaxaca, May 9, 1957. Generally similar to holotype but somewhat longer and proportionately narrower, 10 x 3.25 mm.; mouth parts less prognathous.

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